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Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _09 September 2003_ .

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-86_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-86_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

Response to Amendment

1.   The amendment filed September 9, 2003 has been entered. Claims 18-26, 39-

41, 56, and 81-85 have been amended.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form

the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

3. **Claims 1-14, 18-24, 27-36, 39-40, 42-67, and 72-80 are rejected** under 35

U.S.C. 102(e) as being anticipated by Beckhardt (US 6,138,124 A), hereinafter referred

to as "Beckhardt"

As per claim 1, Beckhardt teaches a network system, comprising:

- "a first computer configured to maintain an object having an attribute, the

  attribute comprised of individual values, the individual values having conflict-

  resolution data" at Col.1 lines 15-25;

- "a second computer configured to maintain a replica object, the replica object being replicated from the object" at Col. 1 lines 25-35;

- "the second computer further configured to replicate the object from the first computer and resolve a replication conflict between a value of the attribute in the object and the value of the attribute in the replica object, the replication conflict being resolved with the conflict-resolution data" at Col. 2 lines 1-21.

As per claim 2, Beckhardt teaches a network system as recited in claim 1, wherein "the second computer is further configured to compare the conflict-resolution data associated with the value of the attribute in the object and the conflict-resolution data associated with the value of the attribute in the replica object to resolve the replication conflict" at Col. 2 lines 1-21.

As per claim 3, Beckhardt teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a version indicator that corresponds to a version of an individual value" at Col. 2 lines 10-21.

As per claim 4, Beckhardt teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual value" at Col. 3 line 39-51;

- "and wherein the second computer is further configured to: compare the version number associated with the value of the attribute in the object and the version

number associated with the value of the attribute in the replica object to resolve

the replication conflict" at Col. 3 line 65 to Col. 4 line 8;

- "and update the value of the attribute in the replica object if the value has a lower

  version number than the value of the attribute in the object" Col. 5 lines 58-67.

As per claim 5, Beckhardt teaches a network system as recited in claim 1,

wherein "the conflict-resolution data comprises an update indicator that corresponds to

when an individual value is updated" at Col. 6 lines 40-45.

As per claim 6, Beckhardt teaches a network system as recited in claim 1,

wherein:

- "the conflict-resolution data comprises an update timestamp that corresponds to

  when an individual value is updated" at Col. 1 lines 35-45 and Col. 6 lines 40-45;

- "and wherein the second computer is further configured to: compare the update

  timestamp associated with the value of the attribute in the object and the update

  timestamp associated with the value of the attribute in the replica object to

  resolve the replication conflict" at Col. 1 lines 35-45 and Col. 5 lines 35-45;

- "and update the value of the attribute in the replica object if the value has an

  earlier update timestamp than the value of the attribute in the object" at Col. 5

  lines 35-45.

As per claim 7, Beckhardt teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a creation indicator that corresponds to when an individual value is created" at Col. 6 lines 40-45.

As per claim 8, Beckhardt teaches a network system as recited in claim 1, wherein

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created" at Col. 1 lines 40-45 and Col. 6 lines 40-45;

- "and wherein the second computer is further configured to: compare the creation timestamp associated with the value of the attribute in the object and the creation timestamp associated with the value of the attribute in the replica object to resolve the replication conflict" at Col. 5 lines 35-45;

- "and update the value of the attribute in the replica object if the value has an earlier creation timestamp than the value of the attribute in the object" at Col. 5 lines 35-45.

As per claim 9, Beckhardt teaches a network system as recited in claim 1, wherein "the conflict-resolution data comprises a version indicator that corresponds to a version of an individual value (Col. 3 lines 40-50) and an update indicator that corresponds to when the individual value is updated" at Col. 6 lines 40-45.

As per claim 10, Beckhardt teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual value and an update timestamp that corresponds to when the individual value is updated" at Col. 3 lines 40-50 and Col. 6 lines 40-45;

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the value of the attribute in the object and the conflict-resolution data associated with the value of the attribute in the replica object; and resolve the replication conflict in favor of the value that first has a higher version number, and second has a later update timestamp" at Col. 5 lines 35-50.

As per claim 11, Beckhardt teaches a network system as recited in claim 1, wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual value and an update timestamp that corresponds to when the individual value is updated" at Col. 1 lines 40-45 and Col. 3 lines 40-50 and Col. 6 lines 40-45;

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the value of the attribute in the object and the conflict-resolution data associated with the value of the attribute in the replica object to resolve the replication conflict" at Col. 5 lines 35-50;

- "update the value of the attribute in the replica object if the value has a lower
  version number than the value of the attribute in the object (Col. 6 lines 7-12),
  and if the version number associated with the value of the attribute in the replica
  object is equivalent to the version number associated with the value of the
  attribute in the object, update the value of the attribute in the replica object if the
  value has an earlier update timestamp than the value of the attribute in the
  object" at Col. 5 lines 35-50.

As per claim 12, Beckhardt teaches a network system as recited in claim 1,
wherein "the conflict-resolution data comprises a creation indicator that corresponds to
when an individual value is created, a version indicator that corresponds to a version of
the individual value, and an update indicator that corresponds to when the individual
value is updated" at Col. 6 lines 50-55 and Col. 4 lines 39-50.

As per claim 13, Beckhardt teaches a network system as recited in claim 1,
wherein:

- "the conflict-resolution data comprises a creation timestamp that corresponds to
  when an individual value is created, a version number that corresponds to a
  version of the individual value, and an update timestamp that corresponds to
  when the individual value is updated" Col. 6 lines 50-55 and Col. 4 lines 39-50,

- "and wherein the second computer is further configured to: compare the conflict-
  resolution data associated with the value of the attribute in the object and the
  conflict-resolution data associated with the value of the attribute in the replica

object; and resolve the replication conflict in favor of the value that first has a later creation timestamp, second has a higher version number, and third has a later update timestamp" at Col. 5 lines 35-50.

As per claim 14, Beckhardt teaches a network system as recited in claim 1, wherein :

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created, a version number that corresponds to a version of the individual value, and an update timestamp that corresponds to when the individual value is updated" Col. 6 lines 50-55 and Col. 4 lines 39-50.

- "and wherein the second computer is further configured to: compare the conflict-resolution data associated with the value of the attribute in the object and the conflict-resolution data associated with the value of the attribute in the replica object to resolve the replication conflict" at Col. 5 lines 35-50;

- "update the value of the attribute in the replica object if the value has an earlier creation timestamp than the value of the attribute in the object; if the creation timestamp associated with the value of the attribute in the replica object is equivalent to the creation timestamp associated with the value of the attribute in the object, update the value of the attribute in the replica object if the value has a lower version number than the value of the attribute in the object" at Col. 5 lines 35-50;

- "and if the version number associated with the value of the attribute in the replica object is equivalent to the version number associated with the value of the attribute in the object, update the value of the attribute in the replica object if the value has an earlier update timestamp than the value of the attribute in the object" at Col. 5 lines 35-50.

As per claim 18, Beckhardt teaches a state-based replication system, comprising:

- "an object having an attribute comprised of linked values, individual linked values having indicators to indicate a change to a linked value of the attribute" at Col. 1 lines 15-25;

- "a computing device configured to replicate the object and, with the indicators, identify a change to a linked value of the attribute" at Col. 1 lines 25-35.

As per claim 19, Beckhardt teaches a state-based replication system as recited in claim 18, wherein "the computing device is further configured to: maintain a replica object, the replica object being replicated from the object; and compare the object with the replica object to identify, with the indicators, a linked value replication conflict" at Col. 2 lines 1-21.

As per claim 20, Beckhardt teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a version indicator that corresponds to a version of a linked value" at Col. 3 lines 39-45.

As per claim 21, Beckhardt teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise an update indicator that corresponds to when a linked value is changed" at Col. 6 lines 50-55.

As per claim 22, Beckhardt teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a creation indicator that corresponds to when a linked value is created" at Col. 6 lines 50-55.

As per claim 23, Beckhardt teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a version number that corresponds to a version of a linked value and an update timestamp that corresponds to when the linked value is changed" at Col. 3 lines 39-45 and Col. 6 lines 50-55.

As per claim 24, Beckhardt teaches a state-based replication system as recited in claim 18, wherein "the indicators comprise a creation timestamp that corresponds to when a linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at Col. 3 lines 39-45 and Col. 6 lines 50-55.

As per claim 27, Beckhardt teaches a state-based replication system, comprising:

- "a first computer configured to maintain a first data structure, the first data structure having a multi-valued attribute comprised of linked values" at Col. 1 lines 15-25.

- "individual linked values having conflict-resolution information to indicate a change to a value of the attribute" at Col. 3 lines 39-50;

- "a second computer configured to maintain a second data structure having the multi-valued attribute comprised of the linked values" at Col. 1 lines 25-35;

- "and the first and second data structures configured to be replicated and to have a replication conflict between a value of the attribute in the first data structure and a value of the attribute in the second data structure resolved with the conflict-resolution information associated with the values" at Col. 2 lines 1-21.

As per claim 28, Beckhardt teaches a state-based replication system as recited in claim 27, wherein "the first and second computers are further configured to: compare the conflict-resolution information associated with the value of the attribute in the first data structure with the conflict-resolution information associated with the value of the attribute in the second data structure; identify a replication conflict; and resolve the replication conflict with the conflict-resolution information associated with the values" at Col. 2 lines 1-21.

As per claim 29, Beckhardt teaches a state-based replication system as recited in claim 27, wherein "the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value" at Col. 3 lines 39-50.

As per claim 30, Beckhardt teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises a version number that corresponds to a version of an individual linked value" at Col. 3 lines 29-50;

- "the first and second computers are further configured to compare the version number associated with the linked value of the attribute in the first data structure with the version number associated with the linked value of the attribute in the second data structure" at Col. 3 line 65 to Col. 4 line 8;

- "the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has a lower version number than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has a lower version number than the linked value of the attribute in the first data structure" at Col. 6 line 60 to Col. 7 line 5.

As per claim 31, Beckhardt teaches a state-based replication system as recited in claim 27, wherein "the conflict-resolution information comprises an update indicator that corresponds to when an individual linked value is changed" at Col. 5 lines 35-45.

As per claim 32, Beckhardt teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises an update timestamp that corresponds to when an individual linked value is changed" at Col. 5 lines 35-45;

- "the first and second computers are further configured to compare the update

  timestamp associated with the linked value of the attribute in the first data

  structure with the update timestamp associated with the linked value of the

  attribute in the second data structure; the first computer is further configured to

  update the linked value of the attribute in the first data structure if the linked value

  has an earlier update timestamp than the linked value of the attribute in the

  second data structure; and the second computer is further configured to update

  the linked value of the attribute in the second data structure if the linked value

  has an earlier update timestamp than the linked value of the attribute in the first

  data structure" at Col. 5 lines 35-50.

As per claim 33, Beckhardt teaches a state-based replication system as recited

in claim 27, wherein "the conflict-resolution information comprises a creation indicator

that corresponds to when an individual linked value is created" at Col. 6 lines 50-55.

As per claim 34, Beckhardt teaches a state-based replication system as recited

in claim 27, wherein:

- "the conflict-resolution information comprises a creation timestamp that

  corresponds to when an individual linked value is created" at Col. 6 lines 50-55;

- "the first and second computers are further configured to compare the creation

  timestamp associated with the linked value of the attribute in the first data

  structure with the creation timestamp associated with the linked value of the

  attribute in the second data structure; the first computer is further configured to

update the linked value of the attribute in the first data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the first data structure" at Col. 5 lines 35-50.

As per claim 35, Beckhardt teaches a state-based replication system as recited in claim 27, wherein:

- "the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value" at Col. 3 lines 39-50;

- "and an update indicator that corresponds to when the individual linked value is changed" at Col. 5 lines 35-50.

As per claim 36, Beckhardt teaches a state-based replication system as recited in claim 27, wherein

- "the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created" at Col. 6 lines 50-55;

- "a version indicator that corresponds to a version of the individual linked value" at Col. 3 lines 39-55;

- "and an update indicator that corresponds to when the individual linked value is changed" at Col. 6 lines 50-55.

As per claim 39, Beckhardt teaches a computer-readable medium having stored thereon a data structure, comprising:

- "a first data field containing an attribute" at Col. 6 lines 50-55;

- "a second data field containing a linked value of the attribute contained in the first data field" at Col. 6 lines 50-55;

- "a third data field containing a version indicator corresponding to a version of the linked value contained in the second data field" at Col. 3 lines 39-50;

- "and a fourth data field containing an update indicator corresponding to when the version indicator contained in the third data field is changed" at Col. 5 lines 35-50.

As per claim 40, Beckhardt teaches a computer-readable medium as recited in claim 39, wherein "the data structure further comprises a fifth data field containing a creation indicator corresponding to when the linked value contained in the second data field is created" at Col. 6 lines 50-55.

As per claim 42, Beckhardt teaches a network system, comprising:

- "a first computer configured to replicate objects at an attribute level, and further configured to maintain an object having a multi-valued attribute, the multi-valued attribute comprised of individual values" at Col. 1 lines 15-25;

- "a second computer configured to replicate objects at an attribute value level, and further configured to maintain a second object, the second object having a multi-valued attribute comprised of individual values, the individual values configured to have conflict-resolution data" at Col. 1 lines 25-25;

- "the first computer further configured to: replicate the second object from the second computer; resolve a replication conflict between the object and the second object at the attribute level; and resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data" at Col. 2 lines 1-21.

As per claim 43, Beckhardt teaches a network system as recited in claim 42, wherein "the first computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level" at Col. 5 lines 35-67.

As per claim 44, Beckhardt teaches a network system as recited in claim 42, wherein "the first computer does not replicate a value from the second object if the value does not have conflict-resolution data" at Col. 5 lines 35-67.

As per claim 45, Beckhardt teaches a network system as recited in claim 42, wherein "the first computer does not replicate a value from the second object if the value has null conflict-resolution data" at Col. 5 lines 35-67.

As per claim 46, Beckhardt teaches a network system as recited in claim 42, wherein "the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has conflict-resolution data" at Col. 5 lines 35-67.

As per claim 47, Beckhardt teaches a network system as recited in claim 42, wherein "the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has non-null conflict-resolution data" at Col. 5 lines 35-67.

As per claim 48, Beckhardt teaches a network system as recited in claim 42, wherein "the second computer is further configured to: replicate the object from the first computer; resolve a replication conflict between the object and the second object at the attribute level; and resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data" at Col. 5 lines 35-67.

As per claim 49, Beckhardt teaches a network system as recited in claim 48, wherein "the second computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level" at Col. 5 lines 35-67.

As per claim 50, Beckhardt teaches a network system as recited in claim 48, wherein "the second computer does not replicate a value from the object if the value does not have conflict-resolution data" at Col. 5 lines 35-67.

As per claim 51, Beckhardt teaches a network system as recited in claim 48, wherein "the second computer does not replicate a value from the object if the value has null conflict-resolution data" at Col. 5 lines 35-67.

As per claim 52, Beckhardt teaches a network system as recited in claim 48, wherein "the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has conflict-resolution data" at Col. 5 lines 35-67.

As per claim 53, Beckhardt teaches a network system as recited in claim 48, wherein "the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a value that has non-null conflict-resolution data" at Col. 5 lines 35-67.

As per claim 54, Beckhardt teaches a network system as recited in claim 48, wherein "the second computer is further configured to delete a value from the second object if the value does not have conflict resolution data, and if the value is not replicated from the object" at Col. 5 lines 35-67.

As per claims 55, 72, Beckhardt teaches a method and a computer readable medium performing the method comprising:

- "replicating an object stored in a first directory with a replica object stored in a second directory, the object and the replica object having an attribute comprised

of individual values, the individual values having conflict-resolution data" at Col. 1

lines 10-35;

- "comparing a value of the attribute in the object with a value of the attribute in the

  replica object to identify a replication conflict; and resolving the replication conflict

  with the conflict-resolution data" at Col. 1 lines 35-55.

As per claim 56, Beckhardt teaches a method as recited in claim 55, wherein

"the conflict-resolution data comprises a version number that corresponds to a version

of an individual value, and wherein said comparing comprises determining if a value

version number has been changed" at Col. 3 line 65 to Col. 4 line 8.

As per claim 57, Beckhardt teaches a method as recited in claim 55, wherein

- "the conflict-resolution data comprises a version number that corresponds to a

  version of an individual value, said comparing comprises determining if a value

  version number has been changed" at Col. 3 line 65 to Col. 4 line 8;

- "the method further comprises updating the value of the attribute that has a lower

  version number with the value of the attribute that has a higher version number"

  at Col. 3 line 65 to Col. 4 line 8.

As per claim 58, Beckhardt teaches a method as recited in claim 55, wherein

"the conflict-resolution data comprises an update timestamp that corresponds to when

an individual value is changed, and wherein said comparing comprises determining if a

value update timestamp has been changed" at Col. 5 lines 35-50.

As per claim 59, Beckhardt teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises an update timestamp that corresponds to when an individual value is changed, said comparing comprises determining if a value update timestamp has been changed, and the method further comprises updating the value of the attribute that has an earlier update timestamp with the value of the attribute that has a later update timestamp" at Col. 5 lines 35-50.

As per claim 60, Beckhardt teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created, and wherein said comparing comprises determining if a creation timestamp has been changed" at Col. 5 lines 35-50.

As per claim 61, Beckhardt teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created, said comparing comprises determining if a creation timestamp has been changed, and the method further comprises updating the value of the attribute that has an earlier creation timestamp with the value of the attribute that has a later creation timestamp" at Col. 5 lines 35-50.

As per claim 62, Beckhardt teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a version number that corresponds to a version of an individual value and an update timestamp that corresponds to when the individual value is changed, and wherein said comparing comprises determining if a value version

number has been changed and if the value update timestamp has been changed" at Col. 5 lines 35-67.

As per claims 63, 64, Beckhardt teaches a method and computer readable medium as recited in claim 55, wherein "the conflict-resolution data comprises a version number that corresponds to a version of an individual value and an update timestamp that corresponds to when the individual value is changed, and the method further comprises updating the value of the attribute that first has a lower version number, and second has an earlier update timestamp" at Col. 5 lines 35-50.

As per claim 65, Beckhardt teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created, a version number that corresponds to a version of the individual value, and an update timestamp that corresponds to when the individual value is changed, and wherein said comparing comprises determining if a value creation timestamp has been changed, if the value version number has been changed, and if the value update timestamp has been changed" at Col. 5 lines 35-50, Col. 6 lines 35-60.

As per claims 66-67, Beckhardt teaches a method as recited in claim 55, wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual value is created, a version number that corresponds to a version of the individual value, and an update timestamp that corresponds to when the individual value is changed" at Col. 6 lines 50-55 and Col. 3 lines 39-50, and the method further comprises "updating the value of the attribute that first has an earlier creation

timestamp, second has a lower version number, and third has an earlier update timestamp" at Col. 5 lines 35-67.

As per claims 73, 80, Beckhardt teaches a method and a computer readable medium performing the method of replicating a linked value of a multi-valued attribute contained in an object comprising: "comparing the conflict-resolution information associated with the linked value in the object with the conflict-resolution information associated with the linked value in the replica object; identifying a replication conflict with the conflict-resolution information; and resolving the replication conflict with the conflict-resolution information" at Col. 2 lines 1-21.

As per claim 74, Beckhardt teaches a method as recited in claim 73, wherein "the conflict-resolution information comprises a version number that corresponds to a version of the linked value, and the method further comprising: determining if the linked value version number has been changed; and updating the linked value of the attribute that has a lower version number with the linked value of the attribute that has a higher version number" at Col. 3 line 65 to Col. 4 line 8.

As per claim 75, Beckhardt teaches a method as recited in claim 73, wherein "the conflict-resolution information comprises an update timestamp that corresponds to when the linked value is changed, and the method further comprising: determining if the linked value update timestamp has been changed; and updating the linked value of the attribute that has an earlier update timestamp with the linked value of the attribute that has a later update timestamp" at Col. 5 lines 35-50.

As per claim 76, Beckhardt teaches a method as recited in claim 73, wherein "the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, and the method further comprising: determining if the linked value creation timestamp has been changed; and updating the linked value of the attribute that has an earlier creation timestamp with the linked value of the attribute that has a later creation timestamp" at Col. 5 lines 35-50 and Col. 6 lines 50-55.

As per claim 77, Beckhardt teaches a method as recited in claim 73, wherein "the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at Col. 3 lines 39-50 and Col. 6 lines 50-55.

As per claims 78-79, Beckhardt teaches a method and a computer readable medium performing the method as recited in claim 73, wherein "the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed, and the method further comprises updating the linked value of the attribute if the linked value first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp" at Col. 5 lines 35-50.

4. **Claims 81-86 are rejected under 35 U.S.C. 102(e)** as being anticipated by Bodnar et al. (US 6,295,541 B1), hereinafter referred to as "Bodnar".

As per claims 81, 86, Bodnar teaches a method and a computer readable medium performing the method, comprising:

- "replicating a first object with a second object, the first object having an attribute comprised of linked values" at Col. 7 lines 10-35;

- "the second object having an attribute comprised of linked values configured to have associated conflict-resolution data" at Col. 25 lines 10-20;

- "resolving first a replication conflict between the first object and the second object at an attribute level; and resolving second, with the conflict-resolution data, a replication conflict between the first object and the second object at an attribute value level" at Col. 33 lines 30 to Col. 34 line 20.

As per claim 82, Bodnar teaches a method as recited in claim 81, further comprising "determining whether a value corresponding to the second object has conflict-resolution data and said replicating the linked value if said determining that the linked value has conflict-resolution data" at Col. 33 lines 30 to Col. 34 line 20.

As per claim 83, Bodnar teaches a method as recited in claim 81, "further comprising determining whether a linked value corresponding to the second object has non-null conflict-resolution data and said replicating the linked value if said determining

that the value has non-null conflict-resolution data" at Col. 8 lines 13-67 and Col. 33

lines 30 to Col. 34 line 20.

As per claim 84, Bodnar teaches a method as recited in claim 81, "said

resolving the replication conflict between the first object and the second object at the

attribute value level in favor of a linked value that has conflict-resolution data" at Col. 8

lines 13-67 and Col. 33 lines 30 to Col. 34 line 20.

As per claim 85, Bodnar teaches a method as recited in claim 81, further

comprising "deleting a linked value corresponding to the second object if the value does

not have conflict-resolution data and if the value is not replicated" at Col. 46 lines 25-57.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 15-17, 25-26, 37-38, 41, 68-71 are rejected** under 35 U.S.C. 103(a) as

being unpatentable over Beckhardt as applied to claims **1-14, 18-24, 27-36, 39-40, 42-**

67, and 72-80 above, and in view of Bodnar et al. (US 6,295,541 B1)

As per claim 15, Beckhardt teaches a network system as recited in claim 1 above. Beckhardt does not teach: "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a value of the attribute in the object". However, Bodnar teaches a similar method including "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a value of the attribute in the object" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 16, Beckhardt teaches a network system as recited in claim 1. Beckhardt does not teach: "the individual values have an associated deletion indicator that corresponds to when an individual value is marked for deletion from the attribute in the object". However, Bodnar teaches a similar method including "the individual values have an associated deletion indicator that corresponds to when an individual values is marked for deletion from the attribute in the object" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion indicator with an individual value as taught by Bodnar to indicate whether an individual value has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 17, Beckhardt teaches a network system as recited in claim 1. Beckhardt does not teach: "the individual values have an associated deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute in the object; and wherein the second computer is further configured to delete a value from the attribute in the object if the value has a deletion timestamp that indicates the value is marked for deletion". However, Bodnar teaches a similar method including: "the individual values have an associated deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute in the object; and wherein the second computer is further configured to delete a value from the attribute in the object if the value has a deletion timestamp that indicates the value is marked for deletion" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 63-67, and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion timestamp with an individual value as taught by Bodnar to indicate the time an individual value has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 25, Beckhardt teaches a state-based replication system as recited in claim 18. Beckhardt does not teach: "the indicators comprise a deletion indicator that has a null identifier to indicate the existence of a linked value of the attribute". However, Bodnar teaches a similar method including "the indicators comprise a deletion indicator that has a null identifier to indicate the existence of a linked value of the attribute" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a

deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 26, Beckhardt teaches a state-based replication system as recited in claim 18. Beckhardt does not teach: "the indicators comprise a deletion timestamp that corresponds to when a linked value is marked for deletion from the attribute" However, Bodnar teaches a similar method including: "the indicators comprise a deletion timestamp that corresponds to when a linked value is marked for deletion from the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 63-67, and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion timestamp with an individual value as taught by Bodnar to indicate the time an individual value has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 37, Beckhardt teaches a state-based replication system as recited in claim 27. Beckhardt does not teach: "the individual linked values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value of the multi-valued attribute". However, Bodnar teaches a similar method including "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 38, Beckhardt teaches a state-based replication system as recited in claim 27. Beckhardt does not teach: "the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute". However, Bodnar teaches a similar method including "the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 41, Beckhardt teaches a computer-readable medium as recited in claim 39. Beckhardt does not teach: "the data structure further comprises a sixth data field containing a deletion indicator corresponding to the linked value contained in the second data field and configured to indicate when the linked value is marked for deletion from the data structure". However, Bodnar teaches a similar method including "the data structure further comprises a sixth data field containing a deletion indicator corresponding to the value contained in the second data field and configured to indicate when the value is marked for deletion from the data structure" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion indicator

with each record as taught by Bodnar to indicate whether a record has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 68, Beckhardt teaches a method as recited in claim 55. Beckhardt does not teach: "the individual values have a deletion timestamp that is a null identifier to indicate the existence of a value of the attribute". However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that is a null identifier to indicate the existence of a value of the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 69, Beckhardt teaches the method as recited in claim 55. Beckhardt does not teach: "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute". However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, in order to make it easier to replicate the change to its replica object.

As per claims 70-71, Beckhardt teaches the method as recited in claim 55. Beckhardt does not teaches: "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute, and the method further comprises deleting a value from the attribute if the value has a deletion timestamp that indicates the value is marked for deletion" However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute, and the method further comprises deleting a value from the attribute if the value has a deletion timestamp that indicates the value is marked for deletion" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Beckhardt to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, in order to make it easier to replicate the change to its replica object.

Response to Arguments

8.   Applicant's arguments filed September 9, 2003 have been fully considered but they are not persuasive. The Examiner respectfully traverses applicant's argument.

Regarding claim 1, Applicant argued that "Beckhardt describes replication for only two level database record (i.e., document: field), rather than the at least three-levels (i.e., object: attribute: value) described in claim 1", therefore, Beckhardt does not show or disclose "an attribute value, or that an attribute value includes conflict resolution data". On the contrary, Beckhardt describes replication method for document which

include a number of fields, wherein each field is a pair comprises of <field name :

value>. An exemplary document structure is described at Col. 6 lines 32-60 is

reproduced below:

> The following example will be helpful in providing an
> understanding of the invention. Assume a document is
> created with the fields Author, Creation Date, Revision Date,
> 35 Subject, Body, and Status, and the following data entered in
> those fields (FSNs are indicated by brackets following the
> field, e.g. [1]):
> (DSN: 1)
> Author: Jane Doe [1]
> 40 Creation Date: 12/1/95 [1]
> Revision Date: 12/1/95 [1]
> Subject: Request for Travel Approval [1]
> Body: I'd like to request approval for a trip to New York City
> [1]
> 45 Status: Request submitted [1]

The above example shows the document structure comprises a number of fields

(i.e., Author, Creation Date, Revision Date, Subject, Body, and status), wherein each

field comprises a field name and a value (i.e., Author: Jane Doe). The structure of

<Document: Field: Value> corresponds to applicant's three level structure <object:

attribute: value>. Further, as seen in the example above, each field value is followed by

a Field Sequence Number (FSN) to be used as conflict resolution data during replication

(See Col. 6 lines 7-12).

Applicant also argued that Beckhardt does not disclose: "a replication conflict

resolved between attribute values in an object and a replica object with the attribute

value conflict resolution data". On the contrary, Beckhardt uses the FSN associated with

each attribute value to resolved replication conflict at Col. 6 lines 7-12 reproduced

below:

> In other embodiments, the system determines which fields
> need to be replicated by finding the actual FSNs of both
> documents and comparing the actual FSNs of corresponding
> 10 fields to determine which is greater. The fields with greater
> FSNs are replicated. This process is particularly suitable
> when the documents have not previously been replicated.

Regarding claim 6, Applicant argued that Beckhardt does not show "an update timestamp that corresponds to an individual value, or any indication that corresponds to when an individual value is updated". On the contrary, Beckhardt describes the use of a timestamp for each field in the document to determine which fields have been updated since the previous replication at Col. 1 lines 40-45 reproduced below:

> In general, in these systems, when a document is
> replicated, the entire document is copied. However, typically
> only small portions of a document are changed between
> replications, and replication of the entire document thus
> wastes time and resources. One possible solution to this 40
> problem, not believed to have been implemented, is to time
> stamp each field in the document and compare the time
> stamps of the fields in the document to be replicated to the
> time stamps of corresponding fields in the unchanged docu-
> ment to determine which fields have been revised since the 45
> previous document replication. However, a full time stamp

Beckhardt also provides an example at Col. 6 lines 30-60 in which the Revision Date (i.e., timestamp) is changed from "12/1/95" to "12/2/95 after the "Managers Comment field" is inserted to the document. This timestamp corresponds to the time when the last individual value is inserted, or updated.

Regarding claims 7-14, 19-24, 28-36, 40, 56-66, 75-78 Applicant argued that Beckhardt does not disclose: "a creation indicator that corresponds to an individual value" nor "a creation timestamp that corresponds to when an individual value is created. On the contrary, as discuss in claim 6 argument, Beckhardt use a timestamp

for each field in the document. Therefore, when a field is created, the timestamp

corresponds to the creation time of that field. Furthermore, in the previous example, the

FSN of the Manager Comment field are set to [2], and the FSN of the Revision Date is

also set to [2], this also serves as an indicator that the field has been created (i.e.,

inserted).

Regarding claim 18, Applicant argued that Beckhardt does not disclose: "an

object having an attribute comprised of linked values" nor "individual linked values

having indicators to indicate a change to a linked value". On the contrary, as discussed

in claim 1 argument, each filed in Beckhardt comprises a field name and field value.

Each field value is followed by a indicator (i.e., FSN) to indicate a change to a field

value.

Regarding claims 27, 42, 55, 73, Applicant argued that Beckhardt does not

disclose: "a replication system that includes a data structure having a multi-value

attribute comprised of linked values". On the contrary, as discussed in the claim 1

argument, Beckhardt teaches a document replication system wherein each document

comprise multiple fields, each field comprises a field name and multiple field values. For

example, the "Author" attribute (i.e., field) having multiple values, each value

corresponds to a name or names of the author(s) of the document. The "Status" field

comprises three possible values: "Request submitted, More information needed,

Approved" (See Example, Col. 7). Furthermore, as discussed in the claim 1 argument,

Beckhardt also discloses "a replication conflict resolved between values in a first data

structure and a second data structure with the resolution information associated with the values" at Col. 6 lines 7-12.

Regarding claim 39, Applicant argued that Beckhardt does not disclose: "a data structure comprising a first data field containing an attribute and a second data field containing a linked value of the attribute". On the contrary, as discussed in the claim 1 argument above, Beckhardt teaches a document structure comprising plurality of fields, wherein each field is a combination of <field name> <field value> followed by a FSN to indicate the version of the field.

Regarding claim 81, Applicant argued that "Bodnar describes synchronization for only a two level dataset (i.e., record: field), rather than the at least three-levels (i.e., object: attribute: linked value) described in claim 81", therefore, Bodnar does not discloses: "an object having an attribute comprised of linked values" nor "a linked value being associated conflict-resolution data". On the contrary, similarly to Beckhardt, Bodnar teaches a method for synchronization two or more datasets comprising multiple records, wherein each record comprises multiple data fields. Each data field of the record comprise a pair <field name> : <field value> (Col. 7 lines 20-30). For example, contact-type record comprises attributes "first name" ,"last name", and "phone number", wherein the attribute "first name" comprises field name "first name" and field value "Bob". Therefore, Bodnar's data structure <record: fieldname: value> corresponds to applicant's three levels structure <object: attribute: linked value>.

In light of the foregoing arguments, the 35 U.S.C 102 and 103 rejections is hereby sustained.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record, listed on form PTO-892, and not relied upon, if any, is

considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been

enclosed in this action, please contact Lisa Craney whose telephone number is **(703)**

305-9601 for faster service.

JEAN R. HOMERE
PRIMARY EXAMINER